

IMPACT OF SPECIFIC CSR ACTIVITIES, EXECUTIVE & BOARD
DIVERSITY ON EQUITY VALUATIONS

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A Thesis Submitted in Partial Fulfillment of the Requirements

for the Degree of

Master of Science

in

Resource and Applied Economics

University of Alaska Fairbanks

May 2018

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Abstract

The objective of this study is to identify the impact of specific corporate social responsibility behaviors on equity prices. This study uses fixed effect parametric and nonparametric regressions to quantify the effect of specific corporate social responsibility activities on the equity price multiples of a number of US firms from 1999 to 2009. The results of these empirical models consistently show that CEO diversity, corporate charitable giving, and work-life balance benefit plans, are associated with lower equity price multiples compared against similar firms that lack these characteristics. Additionally, board diversity and support of the LGBTQ community is associated with a positive impact on equity price multiples. This study provides evidence that individual corporate social responsibility activities can have drastic impacts on equity prices, leading the way for future research testing whether the magnitudes of these impacts are rational and in-line with their expected impact on financial performance and risk, or a deviation from the efficient market hypothesis.

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Introduction

Impact investing is a movement whereby investors actively seek to purchase securities of companies that act in a responsible manner with regard to some social issue, and avoid securities of firms who are irresponsible. The term corporate social responsibility refers to a broad range of topics but can generally be described using three major categories: environmental impact, social responsibility, and corporate governance; these are often referred to as ESG factors. A firm that is polluting an important tributary, paying their workers ‘unfairly’, does not contain a diverse board of directors, or participates in a sin-industry, will be considered to have a low corporate social responsibility score, and thus may be actively avoided by an impact investor. A recent example of this active avoidance would be the “divestment” campaign that recently spread across college campuses in North America. Students protested their universities’ endowment funds involvement in the fossil fuel industry, putting pressure on the endowment funds to sell their holdings in fossil fuel companies. From 2011 to 2016, this movement grew from causing six universities to divest from fossil fuel investments to 16% of all educational institutions in the US (Fossil Free 2015; Arabella Advisors 2016). Another instance of public outcry over firms acting “irresponsibly” is due to recent federal regulations that require public firms to publish their CEO’s salary as a multiple of their median-employee’s wage (Anderson 2018). The more disproportionate executive compensation is compared to the common employee the more the firm is seen as contributing to income and wealth inequality, and would therefore be avoided by impact investors. Alternatively, a firm who pays its employees a living-wage, is active in voluntary environmental cleanup programs, or participates in an affirmative action-like hiring system may be seen as more socially responsible, and thus gain the attraction of impact investors. By incorporating ESG factors into the investment decision, which traditionally only focuses on financial information and shuns emotion, the impact investing movement provides a link for social concerns which are unrelated to financial performance or risk to impact equity valuations.

With the increasing prevalence of impact investing and other similar movements where investors’ portfolio choice is affected by the social impact of the firms, it begs the question of what impact this movement has on equity valuations. If there is some penalty for acting

irresponsibly, or a reward for acting responsibly, then this would encourage firms to act in the way that investors desire them to, and this would in effect be internalizing externalities while simultaneously diverging from the efficient market hypothesis. For example, if a firm is using slave labor to acquire blood diamonds, and their stock became unpopular solely due to investors derision and avoidance of the stock, this would raise the firms cost of capital - limiting the amount of capital and labor available to the firm and moving them down to a lower isoquant. This would in turn reduce the amount of slave labor and blood diamonds being produced and decreasing the amount of disutility created by these actions. This would then be a violation of the efficient market hypothesis as the firms' stock price would be under-valued. The efficient market hypothesis states that a financial assets current price incorporates all publicly available information and is the best guess at its true intrinsic value. If social attitudes impact an investors willingness to pay for a financial asset without an impact on the perceived financial performance or risk of the asset, then the asset is not being valued according to its net present value of future cash flows - but instead by some utility function. This should not affect the valuation of the asset because if the asset was under-valued (according to its net present value of future cash flows) then arbitrage by investors outside of the impact investing movement is possible.

This study aims to quantify the impact of specific CSR behaviors on equity prices and ascertain whether this corrective action is being taken. This study will be analyzing the impact of CEO and Board diversity, the employment of disabled persons, corporate charitable giving, work-life balance benefit plans, and support of the LGBTQ community. So far, most research on CSR's impact on equity prices has been done using aggregate measures; this research will be the first to quantify the impact of specific individual characteristics after controlling for financial performance and risk using general-additive-models.

Literature Review

While the literature on corporate social responsibility, impact investing, etc, is broad, little research has been conducted which examines the impact of specific behaviors or actions or divergences from the efficient market hypothesis. Instead, most research focuses on the impact of CSR with regard to aggregate metrics, and the closest the research gets to answering question of CSR's impact on equity prices is an investigation of the cost of capital which is thought to be

explained by various effects of CSR on firm financial performance and risk. In addition to the effects of CSR on the cost of capital, firm risk and financial performance, the existing literature also gives insights into institutional investor's asset selection with regard to CSR, asymmetry of information, index tracking and the opportunity cost of CSR portfolios. Additionally, it is important to review Fama (1970)'s seminal paper, Efficient Capital Markets. The literature on the impact of CEO and board member diversity is also quite numerous.

The Efficient Market Hypothesis

Fama (1970) describes capital markets as being efficient when "at any point fully reflect available information." Within this theory of capital market efficiency, there are three variations, weak form, semi-strong form, and strong form. Weak form efficiency implies that market prices are reflective of all market information and therefore past returns have no impact on future returns. Semi-strong form efficiency implies that all publicly available information is accounted for in the stock price and prices will react to new information after it is released. This means that in the case of semi-strong form efficiency above-normal rates of return cannot be earned by trading with new information. Strong-form efficiency implies that all information, public and private, is accounted for in the price of the stock. This means that no investor may profit above the average investor when given new information.

Tests of weak-form efficiency include tests of return independence that is to test for auto-correlation in the rates of return of various equities. Tests of semi-strong form efficiency include analyzing the effects of relevant events such as earnings releases or lawsuits on stock prices. Tests of strong form efficiency include testing whether insiders or exchange specialists can achieve super-normal returns, however since the SEC has regulation which forbids insider trading most it is not possible for them to legally achieve these returns. Exchange specialists however have been shown to be able to achieve super-normal returns with their non-public information such as unfilled limit orders. Fama concludes that the evidence in support of market efficiency is robust and extensive, while evidence to the contrary is, rather uniquely for economics, sparse.

Essentially, the EMH states that the price of a financial asset should be reflective of all available information - so if an impact investor were to have a higher willingness-to-pay for a specific

asset because the underlying firm were responsible, any impact on the stock price should be bid-away by rational profit-seeking investors selling the then over-valued stock. If any of the variables discussed in this analysis that are uncorrelated to financial performance or risk, and only an effect on impact-investor utility, has a significant impact on equity prices then that would be a clear violation of the efficient market hypothesis.

Corporate Social Responsibility

Nofsinger and Sulaeman (2018) have researched how institutional investors weight their portfolios towards socially responsible firms. They find that institutional investors' selection of responsible firms is not due to virtues or moral stances but instead due to the economic impact that the responsibility has on the firm's securities. In one notable quote, the authors' state that "companies with ES [environmental & social] concerns experience greater crash risk [i.e., lower ex-post return skewness] and have a higher likelihood of experiencing extreme negative events, such as bankruptcy filing and/or being delisted due to performance reasons from stock exchanges." They also provide evidence that institutional portfolio weightings in high CSR firms follows the likelihood of these negative events. A given example is how institutional ownership in tobacco stocks began a downward trend when the Family Smoking Prevention and Tobacco Control Act [FSPTC] was moved favorably for amendment in the House of Representatives, a full year before the act was actually passed. This evidence supports the theory that institutions' investments in corporate social responsibility is motivated by associated economic risk factors and not the virtues of being moral or socially responsible. Given these findings, any impact on price caused by a CSR variable should be looked at as not just being caused by investor moral sentiment but also due to associated risk factors.

Branch and Cai (2012) in an effort to examine whether an opportunity cost existed for investors in the impact investment movement they created index tracking portfolios with and without screening for CSR concerns. They found that investors could create portfolios of socially responsible stocks with statistically insignificant tracking errors. In other words, it is possible for an investor to replicate the performance of their index of choice, such as the S&P 500, while avoiding companies within the index with CSR concerns, without a statistically significant sacrifice to the accuracy of the index-tracking portfolio. This is an important finding because it

means that at an aggregate level there is not a negative impact on portfolio performance for the socially responsible investor.

Effects of Corporate Social Responsibility on Corporate Financial Performance and Risk

Firms who are actively involved in the corporate social responsibility movement have several advantages over firms with a lower aggregate CSR scores. For example, firms who offer generous paternity leave, employee wellness programs, living wages, and strive for high levels of employee satisfaction in general, are much less likely to face a labor strike, which would hamper future profits, and see increased productivity of labor (Gubler, Larkin, and Pierce 2014). The same risk reduction effect can be seen when examining firms who take ethical stances on other issues such as, animal testing, child labor, carbon footprint, etc. As policy changes tend to follow social movements, firms who are taking these stances and avoiding the relevant activities make themselves unlikely to be litigated against for participating in said activities. This logic also applies to “sin industries” such as tobacco - investing in the oft litigated against tobacco industry would require one to calculate the probability and magnitude of potential lawsuits in order to arrive at an accurate share price. Decreasing participation in socially irresponsible behavior decreases the likelihood of facing future litigation and therefore increases the expected value of the firm. Thus, the cessation of activities that are counter to a CSR strategy is rewarded with enhanced shareholder value (Surroca, Tribó, and Waddock 2010; Cajias, Fuerst, and Bienert 2014).

It has been hypothesized that managers who lead a firm into the realm of CSR are seen as more effective, forward thinking, better able to predict future economic conditions, etc. and therefore are better managers in general. Thus, CSR activity may signal a quality management team that may translate into financial stability and future financial success (Waddock and Graves 1997). This intertwining of social responsibility and a more classical valuation factor is a good example of what makes separating the effects of CSR and risk reduction on equity valuation so difficult.

The number of firms releasing a corporate social responsibility report is increasing in response to the impact investing movement. CSR reports commonly have information such as long-term plans to move to sustainable sourcing, reduce carbon emissions, move away from suppliers who utilize child labor, etc. This gives the investor additional information as to where the company is

headed that otherwise might not be available, thus CSR reduces the information asymmetry between investors and firms that would exist in the absence of CSR activism, resulting in the reduction of stock volatility. There have been numerous empirical studies on this subject (Luo and Bhattacharya 2009; Lee and Faff 2009; Cajias, Fuerst, and Bienert 2014).

Most research concludes that CSR has a negative correlation with the cost of equity and cost of debt. That is to say that *ceteris paribus* firms whose actions align with the ethical priors of investors will have a lower cost of capital than a firm whose actions are morally opposed by the investor. This is mainly attributed to the above stated effects of CSR on the risk of the firms' activities, quality of management, or reduction in information asymmetry. However, there exist a few studies that conflict with the general consensus and instead find a cost of capital premium on CSR activity, specifically Ghoul (2011). Cajias, Fuerst, and Bienert (2014) examined the effect of CSR on the cost of capital for specific industries and noted a "remarkable difference between consumer- and asset-oriented industries". Their findings show that asset-oriented firms' cost of capital are affected by CSR much more than consumer-oriented firms. They also found an increasing marginal effect of CSR on capital costs as capital costs increased. Meaning that risky firms with a high cost of capital have more to gain by undertaking a CSR agenda than lower risk firms with lower costs of capital.

Altruism

Very little research has been done on examining the effects of CSR after controlling for the effect CSR has on financial performance. Information availability, litigation risk, and other effects of CSR should be expected to have an effect on the expected value of the firm's future earnings. Any residual effect on the cost of capital not explained by the effect of CSR on financial performance and risk must be due to a strictly behavioral phenomenon. If the effect that CSR has on the cost of capital is greater in a state populated by moral investors versus a state populated by purely risk-adjusted-yield seeking investors, then there exists some residual effect explained only by altruism. Dupre, Girerd-Potin, and Kassoua (2003) have indirectly studied this altruistic effect. They constructed Markowitz efficient frontiers of two portfolios using the same pool of stocks, one constructed without regard to social performance and another that was made from stocks that had been screened for social performance by removing low CSR companies such as tobacco and firearm producers [negative screening]. The results showed that the socially

minded efficient frontiers had lower expected returns than for a given level of risk than the purely financial minded portfolio. This result indicates that the CSR oriented portfolio makers are willing to take a reduction in the expected return of their investments in exchange for the utility obtained from being socially responsible. This study however focused at the portfolio level so it is uncertain whether the relative inefficiency of CSR portfolios is caused by higher covariance's of high CSR firms, higher risk of high CSR firms, or lower cost of equity of CSR firms. Their study also relies on the assumptions of the Markowitz's theory, such as a normal distribution of returns and the assumption that historical returns can predict future returns, which are not representative of reality and hence their methodology of portfolio construction may not be representative of real investor behavior. However, taken at face value the results state that CSR minded investors are taking a lower risk-adjusted rate of return in order to maintain a socially minded portfolio – pointing towards altruism in return for utility.

Literature on Specific Topics

CEO Diversity

Most research on CEO diversity centers on the glass ceiling, the seemingly impenetrable barrier that keeps women from achieving the position of chief executive officer in publicly owned firms. Most theories as to this phenomenon are based on unobservable *ceteris paribus* differences in perceptions of performance. Wolfers (2006) examined stock returns and found that female CEO's did not have statistically different returns than their male counterparts. Grossman et al. (2016) examined the perceived leadership ability of men and women after controlling for various gender differences such as attractiveness and found that women are perceived to be less effective leaders than their male counterparts are. This research points for any impact on equity valuations due to CEO diversity to be due to perceived differences in ability of the chief executive.

Less research has been conducted examining the impact of non-gender CEO diversity.

Board Diversity

Gul, Srinidhi, and Ng (2011) found that board gender diversity improves stock price informativeness. Adams and Ferreira (2009) found that female board members have better attendance than male board members, and male board members have fewer attendance issues

when they have female counterparts on the board. Despite this positive influence given by the female board members, the effect on firm performance is negative due to companies with fewer takeover defenses. Rose (2007) examined the impact of female board representation and firm performance and found no significant link between them using a sample of Danish firms between 1998 and 2001. While it is clear and obvious that a well-functioning board of directors would lead to a better functioning corporation, the link between board diversity and firm performance is muddled, and therefore so is the link between board diversity and equity valuation.

Less research has been conducted examining the impact of non-gender board diversity.

Employment of Disabled Persons

Little research has been conducted examining the impact of the employment of disabled persons on firm performance and equity prices. Possible theories as to the impact may include: marketing power, reduction of litigation risk (Nofsinger and Sulaeman, 2018), improved corporate reputation, etc.

Corporate Charitable Giving

Lev, Petrovits, and Radhakrishnan (2010) found that corporate charitable giving, under certain circumstances, may actually increase firm revenues. This action is dependent on customers' perception regarding philanthropy, and customer satisfaction's sensitivity to philanthropy. Given these findings, research wishing to establish proof of a violation of the efficient market hypothesis would need to note the distinguishment between an increase in equity valuation due to charitable giving, and an increase in expected revenues given customer sentiment to the brand due to the charitable giving.

Work-life Balance

Beauregard and Henry (2009) examined the effects of work-life balance on performance and found that there was actually a negative relationship, providing employees with positive work-life balance benefits actually hurts performance. It is important to note that Beauregard and Henry (2009)'s result does not dispute the claim that work-life balance may attract better applicants and therefore increase firm value.

LGBTQ Support

Pichler et al. (2017) examined the impact of LGBTQ support and found that it is positively correlated to firm performance due to the firm being seen as an employer of choice. Less-researched but obviously important is the relationship to LGBTQ support and litigation risk, and the greater quality of life given to employees which may then be turned into an increase in productivity, though this is disputed by Beauregard and Henry (2009).

Empirical Model

In similar literature quantifying financial performance, model specifications include the variables of interest and controls for performance or growth, volatility or risk, firm size, capital structure, solvency, and variables to control for heterogeneity such as sector and industry or dividend policy. Given this precedent, the models in this analysis includes indicator variables for the behaviors of interest, controls for capital structure, growth, size, risk, and sector in order to test the hypothesis that these variables of interest are affecting equity valuations.

Dependent Variables

Nominal stock prices are essentially meaningless. One stock valued at \$1,000 a share says nothing about the comparison to another stock valued at \$2,000 a share, the simplest explanation would be the number of shares outstanding are almost guaranteed to be different. For this reason, nominal prices are not an ideal dependent variable. Instead, this analysis uses prices that are normalized by dividing by various accounting metrics - these models will still be testing for the existence of a multiplicative altruistic premium or discount - only the other covariates beta estimates will have more meaning and lower standard errors. The dependent variables used in this analysis will be price to earnings ratio, price to book ratio, and price to sales ratio. It is important to note the pros, cons, and assumptions underlying each of these variables. Price to earnings ratio is asymptotic at zero with respect to earnings. As earnings are positive and approach zero the price to earnings ratio will approach positive infinity. As earnings are negative and approach zero the PE ratio approaches negative infinity. At earnings of zero the price to earnings ratio is undefined. This proposes a challenge of how to adjust these numbers to make a regression analysis meaningful if it were to be run in levels. However, when running the

dependent variable as a logarithm, observations are lost due to the PE ratio being negative for a number of firms at various points in time. The price to book ratio is easy to understand, however different types of firms of similar size will often have drastically different book values. For example, a consulting firm is likely to have a much lower book value than a manufacturing firm is because they do not require nearly as much capital investment and instead rely on labor. Price to sales ratio is similar to price to earnings except that it will not have missing observations due to logging negatives because revenues of course cannot be negative. Additionally, different types of firms will have differing price to sales ratios because they have other sources of income. Firms in the financial sector for example would be expected to have high price to sales ratios as a major source of income would be interest revenues, which is not included in sales. Each of these variables have their own limitations, but each will be able to give insights into whether or not equities are being traded with a multiplicative premium or discount due to specific CSR behaviors.

The following equation defines the dependent variables:

Equation (1)

$$Y_i = \sum_{t=1}^N \frac{CashFlow_{it}}{(1 + r_{it})^t * Z} = \frac{Price}{Z}$$

where Z is equal to Earnings, Assets, or Price depending on the model, and $CashFlow_{it}$ and r_{it} are implicit.

Independent Variables

The independent variables used in these models will consist of measures of financial performance, capital structure, and risk to act as controls, as well as indicator variables for specific CSR behaviors. *CapitalStructure* is the total debt to equity; the higher this number the more of the firm's profits are pegged to go to bond holders, the expected sign of this covariate is negative. *Growth* is the trailing 12-month growth rate of earnings before interest, taxes, depreciation, and amortization will capture the effect of estimated growth rates, the expected sign of this covariate is positive. *DiscountRate* is the cost of equity - the discount rate applied to the firms' future cash flows for equity holders, the expected sign of this covariate is negative.

The variable *Sector* is a factor variable indicating the sector that the firm belongs in, such as Consumer Non-durable Goods, Energy, etc. *Size* is the number of employees within the firm, this measure of size is less common than market capitalization, total assets, or total revenues, but these variables would cause an endogeneity problem as they are each found within the definition of the dependent variables. Figure 1 shows the direct relationship between firm revenues and number of employees. *Year* is a factor variable, allowing the dependent variables to fluctuate over time with macro level events not captured in the other variables.

The selected CSR variables of interest are *ceodiv*, *boarddiv*, *empdisabled*, *charity*, *worklife*, and *lgbtq*. These variables indicate whether or not a woman or other minority is at the position of CEO, the board of directors contains one or more women or other minorities, whether or not the firm has a noticeable proportion of disabled employees, the firm donates more than 1.5% of earnings to charity, whether the firm offers a positive work-life balance benefit package, and whether the firm is notable for its support of the LGBTQ community. These variables were chosen because from a social perspective they are unambiguously “good”, meaning that any unqualified statement opposing these distinctions or behaviors would likely be seen by the majority of people as politically incorrect. All of these CSR variables would therefore be desirable to a member of the impact investing movement, and therefore the firm’s equity should be more desirable.

Data

Data was obtained from two sources, Bloomberg and KLD Stats. Bloomberg provided data for the control variables and KLD Stats provided the data regarding CSR characteristics. The data used in the analysis consists of all US public equities where data was available for all of the selected variables of interest; therefore, the full list of securities available from either source is dramatically reduced due to missingness.

No data is available for firms that are no longer in business or were absorbed, or otherwise no longer exist in their previous form; therefore, our data is subject to survivorship bias. Figure 2 shows the data distribution of the unbalanced panel dataset of various companies from 1999 to 2009, notice the missingness in early years and the general lack of missingness in the later years which will cause survivorship bias. The missingness in the year 2009 is not due to defunct

businesses, but due to simple missing data points causing some observations to be dropped in that year.

All continuous variables were centered and scaled to have mean zero and unit variance in order to reduce computational complexity. The impact of this is that the continuous control variables have a different interpretation, instead being in terms of standard deviations. However, since this analysis focuses on the CSR indicator variables that are unchanged, the interpretation of these variables remain simple changes to the intercept of the regression lines and may be interpreted as percentage changes to the dependent variable due to the log-level form.

As seen in Table 1, the CSR activity of interest that least frequently occurs is the employment of disabled persons, with an occurrence of only 2.9%. Still, given our large sample size of 4703 in our lowest sample model, this indicator occurs 136 times. There should be little worry that this dataset is too small to conduct this analysis. The CSR activity that occurs most frequently is LGBTQ support, which occurs in 18.1% of observations, or 851 observations out of 4703 in our smallest model.

Figure 3 shows the distribution of observations within the various sectors. As mentioned with the CSR variables, there are clearly enough observations of each factor level to have a meaningful regression analysis.

Model Specification

Hausman tests indicate that the individual-specific effects are correlated with the independent variables, and therefore random effect regressions would be inconsistent. Therefore, fixed effect regressions are appropriate.

The fixed effects parametric model is shown below:

Equation (2).

$$Y_{itz} = \beta_{0z} + \beta_z * CSR_{it} + \psi_z * Control_{it} + \epsilon$$

where Y_{itz} is the z th dependent variable for firm i at time t and all β_z and ψ_z are vectors of regression coefficients associated with CSR_{it} and $Control_{it}$, vectors of CSR indicator variables and controls for financial risk and performance of the i th firm at time t .

The fixed effects general additive model is shown below:

Equation (3)

$$Y_{itz} = \beta_{0z} + \beta_z * CSR_{it} + \gamma_z * Control_{it} + \epsilon$$

where Y_{itz} is the z th dependent variable for firm i at time t and all β_z is a vector of regression coefficients associated with CSR_{it} , a vector of CSR indicator variables, and γ_z is a vector of smooth terms fitted by splines associated with $Control_{it}$, a vector of controls for financial risk and performance of the i th firm at time t .

General-additive-models¹ are especially useful for this fixed effects regression because the coefficient of interest is still as easily interpreted as it is in an OLS regression, but the GAM extracts more information from the data and allows for a higher R^2 and truer fit of the model to what is empirically observed. By allowing the continuous control variables to be fit with a spline, we eliminate the restriction that the theoretical relationship is empirically replicable with some 2nd, 3rd, or n th degree polynomial, which is an unnecessary and unfounded assumption. By using splines instead of polynomials to fit the continuous control variables, the estimated regression lines fit closer to what is empirically observed - reducing the residuals and allowing the regression coefficients for the CSR indicator variables to be more accurate.

Empirical Analysis

In order to confidently state that a covariate has an impact on price, it should be consistent in sign and statistical significance across all three models, otherwise one cannot rule out the possibility that the covariate is influencing the divisor inside of the dependent variables. However, even if a covariate is only significant in one of the three models it still provides evidence that firms valuations are being impacted by the behavior associated with the covariate.

¹ All general additive models were fit using the 'mgcv' R package:

Wood, S.N. (2011) Fast stable restricted maximum likelihood and marginal likelihood estimation of semiparametric generalized linear models. Journal of the Royal Statistical Society (B)

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This is not a contradiction, a firm which participates in a specific CSR activity may not have a strict percentage premium or discount associated with it, but instead change the valuation methodology used to find the firms intrinsic value - such as changing the relative importance of assets and liquidation value compared to future cash flows represented better by an earnings or sales valuation multiple.

As all of the parametric models show evidence of auto-correlation and heteroscedasticity, as shown by the p-values of the diagnostic tests reported alongside the model results, all parametric models have been reported with Arellano standard errors that are robust in the presence of auto-correlation and heteroscedasticity, Arellano (1987). Panel unit-root tests show no evidence of non-stationarity within the data.

Parametric Models

As seen in Table 2 the parametric models on price to earnings ratio, price to sales ratio, and price to book ratio, had sample sizes of 4703, 5059, and 5120 respectively. The R^2 's these models were 0.52, 0.87, and 0.73 respectively. As seen in Figures 4, 6 and 8, the residuals of the price to earnings, price to sales, and price to book models follow an approximately normal distribution, and as shown in Figure 5, 7, and 9, the respective models variance of the residuals are mildly heteroskedastic.

CEO Diversity is statistically significant in the price to sales and price to book models. The estimated coefficients are -0.106 and -0.147, which when following the methodology of Halvorsen and Palmquist (1980), translates into an impact of -10% and -13.6% respectively on a firm's price to sales and price to book ratios for having a woman or other minority as their chief executive officer. The price to sales model result is statistically significant to the 10% level while the price to book ratio coefficient is significant to the 1% level. The price to earnings model did not have a significant result for this variable.

Board diversity was statistically significant in the price to earnings model to the 1% level. The estimated coefficient for this model was -0.098, which translates into an impact of -9.3% for having a diverse board of directors. While this coefficient is practically large and is significant, the other two models were not significant. These results may be reflective of the mixed results found in the literature.

The variable *empdisabled* is not statistically different from zero in any model. The minimum p-value for this variable was found in the price to book ratio model and had a value of 0.32.

Charitable giving was statistically significant in the price to sales and price to book models. The estimated coefficients of these models are -0.135 and -0.155, which translate into impacts of -12.6% and -14.4% on a firm's price to sales and price to book ratios respectively. These results are statistically significant to the 1% level.

Work-life balance benefit plans are statistically significant in all three parametric models. The coefficients of these two models are -0.165, -0.245, and -0.126. These translate into a -15.2% change in price to earnings ratio, a -21.7% change in price to sales ratio, and -11.8% change in price to book ratio for firms indicated to have a strong work-life balance benefit plan. These results are all significant to the 1% level. Given these results, one can confidently say that work-life balance benefit plans have a statistically significant and practically large effect on the valuation of equities within this sample.

LGBTQ was not statistically significant in any of the three parametric models.

Non-Parametric Models

As seen in Table 3 the non-parametric models on price to earnings ratio, price to sales ratio, and price to book ratio, had N's of 4703, 5059, and 5120 respectively. The adjusted- R^2 's these models were 0.52, 0.88, and 0.74 respectively. Compared to the results of the parametric models, the results found in the non-parametric models are very similar. Standard deviations are slightly different when compared to the parametric models but statistical significance did not change between the two methods – anything significant to the 10% level in the parametric models was also significant in the non-parametric models. The most noticeable difference in the methods when examining the indicator variables of interest are that the coefficients are slightly different between the two methods (with rounding, differences do not occur at the thousandths place).

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The variable *empdisabled* is not statistically different from zero in any model.

Charitable giving was statistically significant in the price to sales and price to book models. The estimated coefficients of these models are -0.135 and -0.155, which translate into impacts of -12.6% and -14.4% on a firm's price to sales and price to book ratios respectively. These results are statistically significant to the 1% level.

Work-life balance benefit plans are statistically significant in all three parametric models. The coefficients of these two models are -0.165, -0.245, and -0.126. These translate into a -15.2% change in price to earnings ratio, a -21.7% change in price to sales ratio, and -11.8% change in price to book ratio for firms indicated to have a strong work-life balance benefit plan. These results are all significant to the 1% level. Given these results, one can confidently say that work-life balance benefit plans have a statistically significant and practically large effect on the valuation of equities within this sample.

LGBTQ was not statistically significant in any of the three parametric models.

Conclusions and Implications

The use of general additive models within this paper offer the same results as robust fixed effect regressions. The non-parametric models however offer a slightly higher R^2 , slightly different coefficients, and slightly better predictive power due to those changes.

The presence of a woman or other minority CEO is associated with lower stock prices after controlling for financial performance and risk. This may be due to a perception that women lack leadership or financial ability such as mentioned in the literature. However, it could also be due

to uncontrolled heterogeneity. As these models only controlled for sector and not industry, if women or other minorities are more likely to be CEO's of companies in industries that commonly have lower valuation multiples then this estimated impact would be overstated due to omitted-variable bias. An example of this situation could be; a women's health product company being headed by a woman and women's health companies having lower expected growth than comparable firms in the same sector. Further research could control for this heterogeneity and repeat the analysis or break down the variable further into two variables for women and minorities. Given these possibilities, one should hesitate when trying to apply causality to these results - future research is needed to state definitively that appointing a female or other minority CEO would be met with a lower equity valuation.

Board diversity is associated with a negative impact on price to earnings ratio models and a insignificant impact on price to sales and price to book ratio models. This inconsistency might alarm some; however, as the price to earnings ratio model is significant to the 5% level, it still may be that the true impact is positive or zero. Given the literatures mixed findings that board diversity improves firm reputation and CSR measures, increases board performance and attendance, but may reduce take-over defenses, these mixed results are not violating any theoretical assumptions.

The employment of disabled persons is not statistically significant in any of the parametric or non-parametric models. Given the lack of literature on this specific topic, one must rely on theory provided by labor economics. If firms pay their employees their marginal revenue product, the employment of a person disabled or not should have no impact on the firm's financial well-being. Another explanation could be that any losses incurred because of paying labor more than their marginal products could be offset by the improved public opinion of the firm and the marketing power that hiring a disabled labor force entails. Further research could expand this research to find explicit and implicit costs associated with employing disabled persons and the benefits that come with such employment, say positive consumer sentiment.

Corporate charitable giving is punished with lower price to sales and price to book ratios. The obvious theory for this result is that by donating cash flows, the firm is bypassing the opportunity to distribute those cash flows to shareholders and so the firm's value is reduced. The fact that charitable giving was not significant in the price to earnings ratio model is also telling, as

charitable donations up to 10% of the firms' earnings are tax-deductible and therefore reduce the earnings of the firm. This result is not surprising and appears to support the efficient market hypothesis. Further research could use additional data on charitable giving, namely the dollar value, and test if the impact on prices is proportional to the amount of donations. If the impact were negative and greater in magnitude than the amount of donations, then that would be evidence that investors are punishing the firm for its charitable behavior to cease it. If the impact on equity prices were positive, or negative but lower in magnitude than the level of donations then the efficient market hypothesis would not hold, as investors would be overpaying for the firm's equity due to a reception of utility for the firms' charitable behavior. In effect, the charity would be being passed from the investor to the firm and to the end recipient.

The magnitude of the impact on work-life balance benefit plans is extremely large. For these impacts to be rational, they would have to be proportional to the cost to the firm of these activities. For example, for a 13% reduction in a firm pricing multiple to be rational according to the efficient market hypothesis, it would have to be accompanied with a 13% reduction in cash flows, otherwise there may be some punishing effect - where investors are punishing the firm for wasteful spending to halt the behavior. However, due to the large impact on price to earnings and price to sales ratios, those impacts on earnings and sales are already accounted for. The remaining impact on the equity valuations must be due to associated higher risk or lower growth which accompany a work-life benefit plan. The sheer magnitude of these impacts necessitates further research. Further research could quantify this impact after measuring the expenses, revenues, risk, and growth, associated with the work-life benefit plans to test the hypothesis that the magnitude of this effect is rational and in-line with economic theory or a deviation from the efficient market hypothesis.

The non-significant impact on stock prices associated with corporate support of the LGBTQ movement may be explained with pointed rationality. The support of LGBTQ employees does not carry with it a decrease in litigation risk or attract employees which offer a higher value due to their being paid the marginal revenue product. Further research could, survey institutional and private investors regarding their beliefs of the impact of LGBTQ support on a firm's litigation risk, quantify the costs associated with LGBTQ support, and testing if the estimated impact on

equity prices is rational according to the costs and perceived risk reduction associated with LGBTQ support.

While these results are promising and show that corporate social responsibility activity can influence a firm's equity price, the impact investing movement is getting more popular and increasing in size as measured by assets under management as time goes on. The dataset used in this analysis only goes to 2009, leaving the most recent 9 years, where impact investing has been the most prevalent, unresearched by this analysis. It is likely that if this analysis were performed on a newer set of data one would find significant evidence of specific corporate social responsibility activity's impact on equity pricing. The most important contribution that this paper has made is that it lays the groundwork for further research to quantify the costs and benefits accrued by firms participating in corporate social responsibility. By showing conclusively that corporate social responsibility actions have drastic impacts on equity valuations after controlling for performance and risk, the next step is to quantify if those impacts are rational, punishing management teams to halt the behavior, or an altruistic deviation from contemporary financial valuation methodologies due to the incorporation of a social utility function into the investment decision. The impact investing movement provides a logical pathway for the third option to materialize.

Appendix

Figure 1

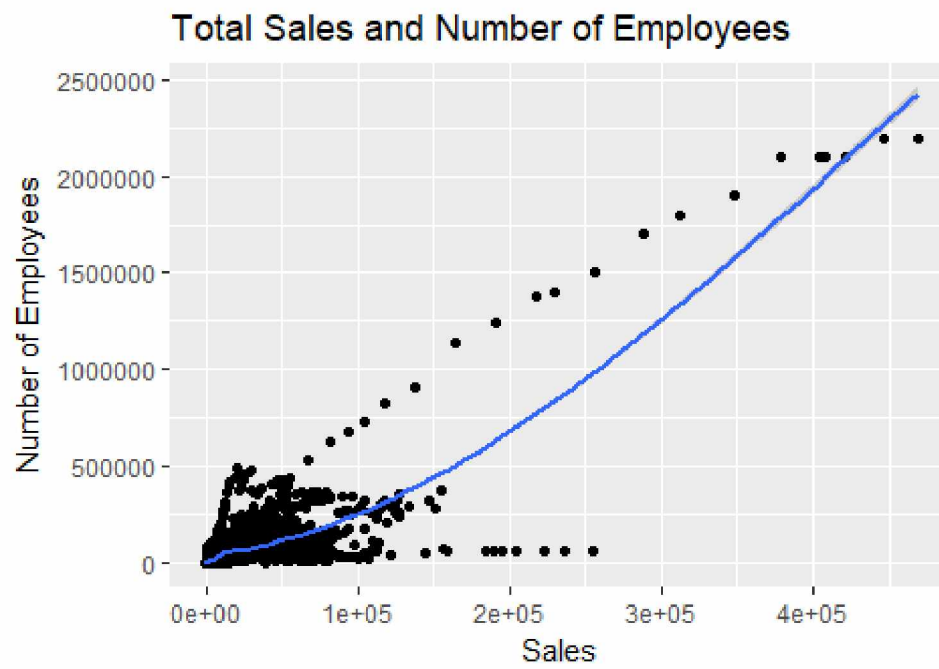


Figure 2

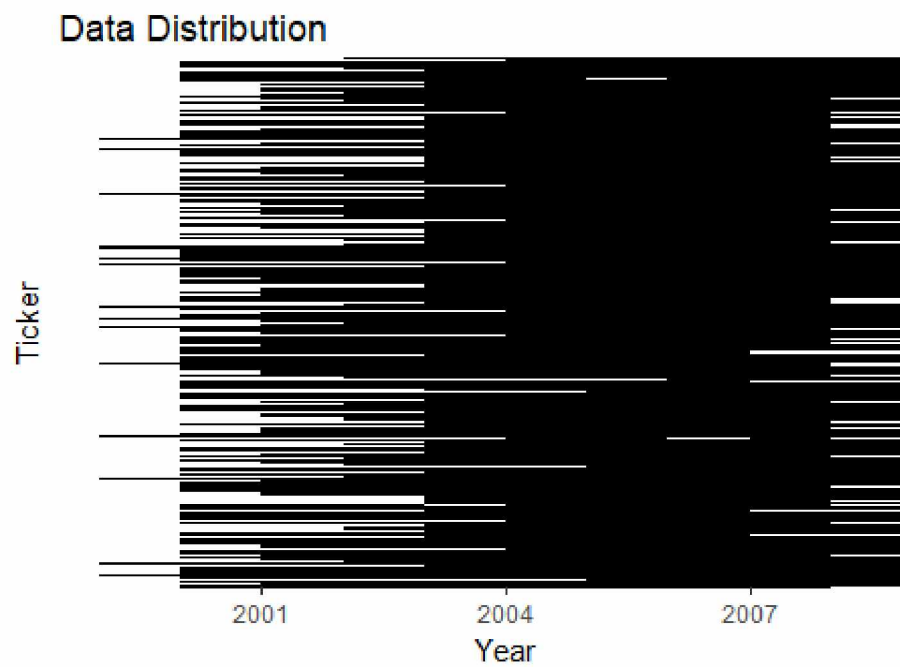


Figure 3

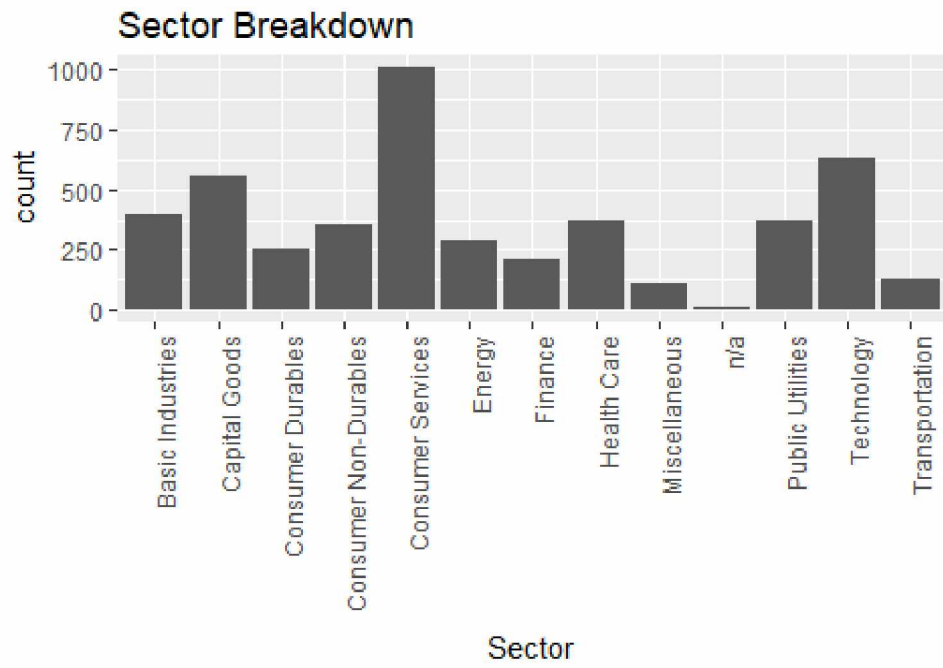


Figure 4

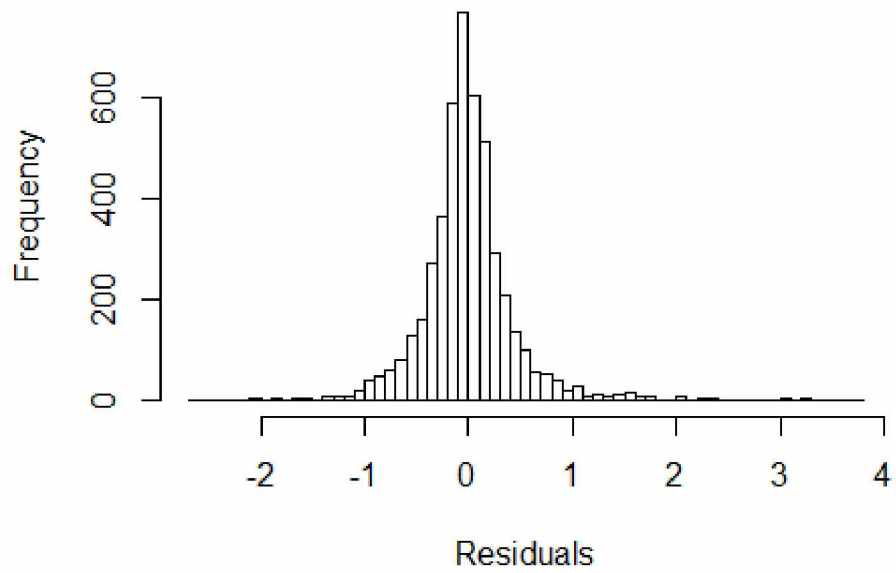


Figure 5

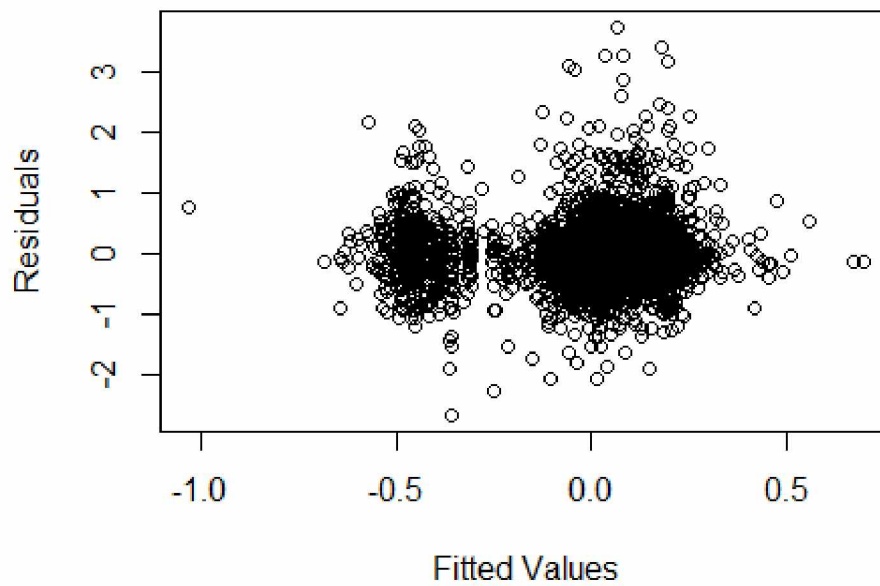


Figure 6

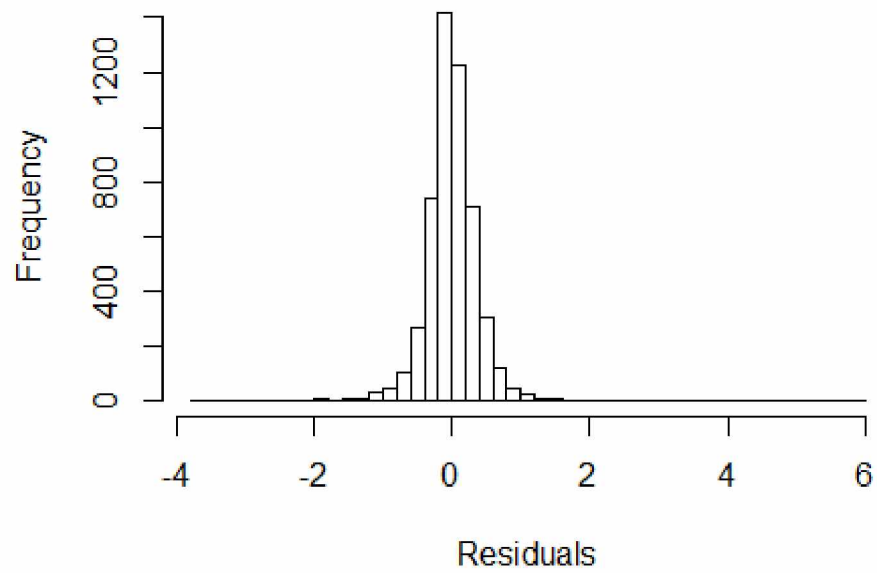


Figure 7

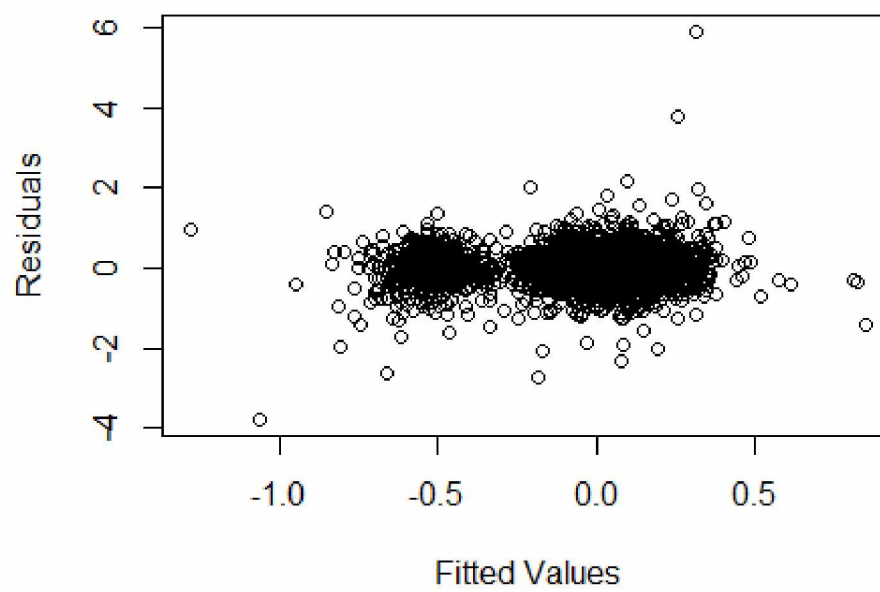


Figure 8

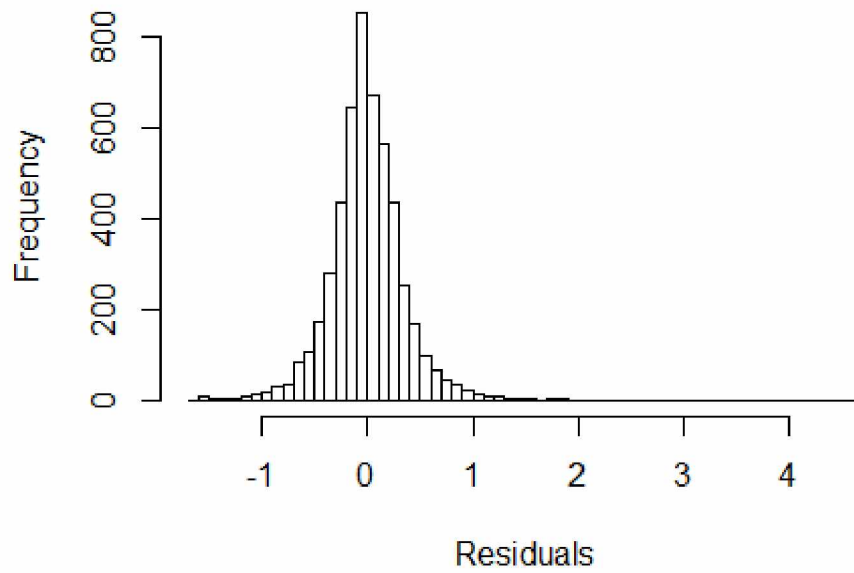


Figure 9

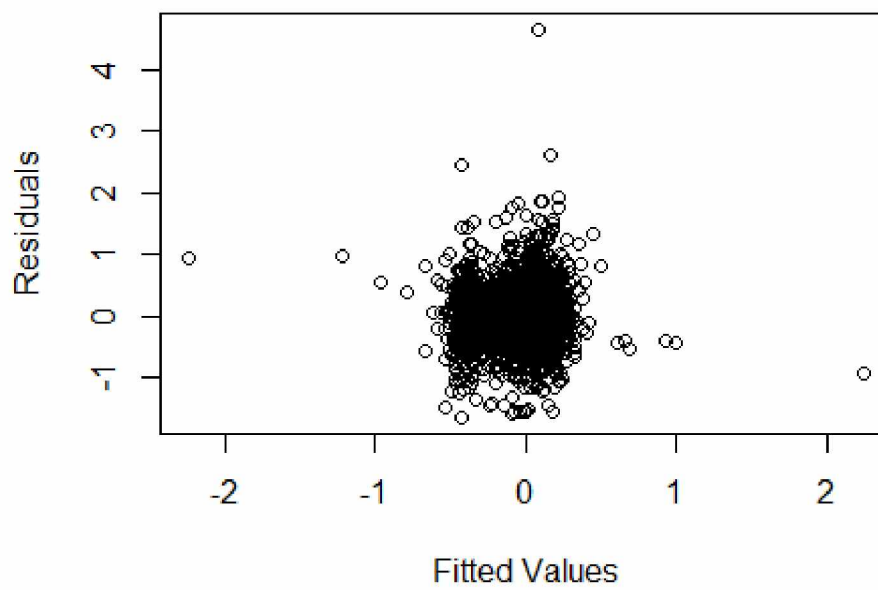


Table 1: Summary Statistics

Statistic	N	Mean	St. Dev.	Min	Max
Year	5,177	2,005.298	2.489	1,999	2,009
lnPE	4,703	3.002	0.729	−0.849	7.748
lnPS	5,059	0.367	1.166	−5.099	9.962
lnPB	5,120	0.943	0.783	−3.024	7.861
ceodiv	5,177	0.053	0.225	0	1
boarddiv	5,177	0.107	0.310	0	1
empdisabled	5,177	0.029	0.169	0	1
charity	5,177	0.032	0.176	0	1
worklife	5,177	0.089	0.285	0	1
lgbtq	5,177	0.181	0.385	0	1
CapitalStructure	5,177	−0.000	1.000	−0.065	67.237
Growth	5,177	−0.000	1.000	−6.119	45.630
Sales	5,177	0.000	1.000	−0.332	20.185
DiscountRate	5,177	0.000	1.000	−7.345	20.182
Size	5,177	−0.000	1.000	−0.254	23.357

Table 2: Linear Regression Model Results

	<u>Dependent variable:</u>		
	<i>lnPE</i>	<i>lnPS</i>	<i>lnPB</i>
<i>ceodiv</i>	0.08 (-0.066)	-0.106* (-0.059)	-0.147*** (-0.057)
<i>boarddiv</i>	-0.098*** (-0.037)	-0.001 (-0.032)	0.032 (-0.039)
<i>empdisabled</i>	0.01 (-0.06)	-0.048 (-0.053)	0.064 (-0.064)
<i>charity</i>	-0.019 (-0.059)	-0.135*** (-0.052)	-0.155*** (-0.055)
<i>worklife</i>	-0.165*** (-0.063)	-0.245*** (-0.056)	-0.126** (-0.062)
<i>lgbtq</i>	-0.022 (-0.038)	-0.045 (-0.034)	-0.008 (-0.033)
<i>Capital Structure</i>	0.005 (-0.003)	-0.046 (-0.049)	0.080*** (-0.027)
<i>Growth</i>	-0.016 (-0.016)	0.003 (-0.008)	0.022** (-0.011)
<i>Discount Rate</i>	0.002 (-0.018)	-0.078*** (-0.017)	-0.043*** (-0.013)
<i>Size</i>	-0.124*** (-0.032)	-0.168*** (-0.043)	-0.185*** (-0.049)
<i>Constant</i>	2.526*** (-0.291)	-1.086*** (-0.154)	0.249 (-0.188)
<i>Observations</i>	4,703	5,059	5,120
<i>Adjusted R2</i>	0.52	0.87	0.73

Table 3: General Additive Model Results

	<u>Dependent variable:</u>		
	<i>lnPE</i>	<i>lnPS</i>	<i>lnPB</i>
<i>ceodiv</i>	0.08 (-0.074)	-0.106* (-0.057)	-0.147*** (-0.055)
<i>boarddiv</i>	-0.098** (-0.042)	-0.001 (-0.033)	0.032 (-0.032)
<i>empdisabled</i>	0.01 (-0.07)	-0.048 (-0.055)	0.064 (-0.053)
<i>charity</i>	-0.019 (-0.066)	-0.135*** (-0.052)	-0.155*** (-0.050)
<i>worklife</i>	-0.165** (-0.066)	-0.245*** (-0.052)	-0.126** (-0.050)
<i>lgbtq</i>	-0.022 (-0.039)	-0.045 (-0.030)	-0.008 (-0.029)
<i>Capital Structure</i>	0.005 (-0.014)	-0.046 (-0.010)	0.080*** (-0.010)
<i>Growth</i>	-0.016 (-0.011)	0.003 (-0.008)	0.022** (-0.008)
<i>Discount Rate</i>	0.002 (-0.015)	-0.078*** (-0.010)	-0.043*** (-0.009)
<i>Size</i>	-0.124*** (-0.040)	-0.168*** (-0.032)	-0.185*** (-0.031)
<i>Constant</i>	2.526*** (-0.323)	-1.086*** (-0.261)	0.249 (-0.254)
<i>Observations</i>	4,703	5,059	5,120
<i>Adjusted R2</i>	0.52	0.88	0.74

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